AMENDMENTS TO THE SPECIFICATION

Please amend the specification as follows.

Please amend the last paragraph of page 14 through the first paragraph of page 15 as follows:

Fig. 5 is a flowchart showing a flow of processes for extracting in-focus portions and creating a composite image according to the present invention. Two images Ai,j and Bi,j whose focal positions are shifted from each other are captured. The focal positions are shifted by sending the focus control signal S3 from the control computer 111 to the lens control circuit 109 to adjust exciting current for the electron lens 106, as described using Fig. 1. Step 501 creates a differential absolute value image for each of the two captured images (ΔxyAi,j for Ai,j and ΔxyBi,j for Bi,j). A differential absolute value image is created using values acquired by adding the absolute value of the difference between a pixel and another pixel shifted n pixels from the pixel in the x-direction to the absolute value of the difference between the same pixel and another pixel shifted n pixels from the pixel in the y-direction, as indicated by the formula (1).

$$\Delta xy\,\mathrm{A}\ \mathrm{i},\ \mathrm{j} = \Delta x\,\mathrm{A}\ \mathrm{i},\ \mathrm{j} + \Delta y\,\mathrm{A}\ \mathrm{i},\ \mathrm{j} \qquad (1)$$

$$\Delta xy\,\mathrm{B}\ \mathrm{i},\ \mathrm{j} = \Delta x\,\mathrm{B}\ \mathrm{i},\ \mathrm{j} + \Delta y\,\mathrm{B}\ \mathrm{i},\ \mathrm{j}$$

$$\Delta x\,\mathrm{A}\ \mathrm{i},\ \mathrm{j} = \left|\,\mathrm{A}\ \mathrm{i},\ \mathrm{j} - \mathrm{A}\ \mathrm{i}+\mathrm{n},\ \mathrm{j}\,\right|,\quad \Delta x\,\mathrm{B}\ \mathrm{i},\ \mathrm{j} = \left|\,\mathrm{B}\ \mathrm{i},\ \mathrm{j} - \mathrm{B}\ \mathrm{i}+\mathrm{n},\ \mathrm{j}\,\right|$$

$$\Delta y\,\mathrm{A}\ \mathrm{i},\ \mathrm{j} = \left|\,\mathrm{A}\ \mathrm{i},\ \mathrm{j} - \mathrm{A}\ \mathrm{i},\ \mathrm{j}+\mathrm{n}\,\right|,\quad \Delta y[\Delta x]\mathrm{B}\ \mathrm{i},\ \mathrm{j} = \left|\,\mathrm{B}\ \mathrm{i},\ \mathrm{j} - \mathrm{B}\ \mathrm{i},\ \mathrm{j}+\mathrm{n}\,\right|$$

Please amend the last paragraph of page 29 through the first paragraph of page 31 as follows:

Fig. 18 is a schematic diagram showing an image composing process in which an in-focus degree is determined using different types of signals detected at the same time

according to an embodiment of the present invention. Different types of signals that can be detected at the same time in a scanning electron microscope are secondary electrons and reflection electrons. A general SEM image uses secondary electrons, but reflection electrons are sometimes used to obtain additional information about a sample. When a full-focused image is composed using reflection electrons, if reflection electron signals are [week] weak and, as a result, the S/N ratio of each reflection electron image having a different focus is low, an image obtained by applying a differential process or a Sobel filter to a reflection electron image sometimes cannot be used for accurately performing in-focus determination. In this case, a secondary electron image is used for in-focus determination, while a reflection electron image is used for image composition. Numerals 1801 and 1802 denote a plurality of reflection electron images and a plurality of secondary electron images, respectively, captured at the same time by changing a focus. Therefore, a point g1 in an image 1801 and a point g1 in an image 1802 have different signal intensities but are located at the same position in a sample. Each of images 1803 is obtained by applying a Sobel filter to one of the secondary electron images 1802. Pixels Sg1 through Sg5 at same coordinates in the plurality of images 1803 are compared, and of these pixels, the largest one is detected. Supposing that pixel is the pixel Sg2, a pixel value g2l of a reflection electron image acquired at the same time with a pixel value g2 of the original image corresponding to the pixel Sg2 is projected to a pixel at the same coordinates in a composite image. A reflection electron composite image 1803 can be created by applying this process to all coordinates of the images.

Please amend the last paragraph of page 39 through the first paragraph of page 40 as follows:

The electron beam 3002 that has been focused on the wafer is deflected by a deflector 3006 so that it is scanned on the wafer surface two-dimensionally or one-dimensionally. Part of the wafer irradiated with the electron beam 3002, in turn, emits secondary electrons 3007. The secondary electrons 3007 are detected by a secondary electron detector [8] 3008 and converted into an electric signal. It should be noted that even though the following description assumes and thereby explains that the secondary electrons 3007 are detected, reflection electrons may be detected instead of, or in addition to the secondary electrons 3007.

Please amend the last paragraph of page 53 through the first paragraph of page 54 as follows:

Since a full-focused image composing means 4230 has the same configuration as that for a full-focused image composing means 4220, the full-focused image composing means 4220 will be mainly described. Input images are preprocessed by a preprocessing means 4210, and then the noise of the input images is reduced by a noise reducing means 4300. Specific examples of the noise reducing means include a noise reduction filter and smoothing reduction. Here, smoothing reduction example will be described. A noise amount evaluating means 4310 calculates noise amount evaluation values 4311 of noise-reduced images 4301, while a signal change amount evaluating means 4320 calculates signal change amount evaluation values 4321, which indicate in-focus degrees, from the noise-reduced images 4301. A focus determination means 4340 generates a maximum signal change amount value 4342 and composition information 4341 using the signal

change amount evaluation values 4321. The maximum signal change amount value 4342 is fed to a noise determination means 4330, which outputs favorableness degree information 4331 indicating the degree of noise influence. The full-focused image composing means 4230 operates similarly as the full-focused image composing means 4220. However, if a noise reducing means 4350 is set so that it provides larger smoothing reduction than the noise reducing means 4300 does, the processing results from the full-focused image composing means 4230 shows larger noise reduction effect but reduced space resolution, compared with those from the full-focused image composing means 4220. That is, while the full-focused image composing means 4220 provides an image that does not have many favorable portions free from noise influence but has a high space resolution, the full-focused image composing means 4230 provides an image that has many favorable portions free from noise influence but has a low space resolution. A composing means 4240 composes a composite image 4250 that has many favorable portions free from noise influence and a high space resolution, by selecting each pixel subjected to less noise influence from one of the images to compose a composite image having little noise. Although this example uses two full-focused image composing means, the example can easily be extended to employ three or more full-focused image composing means.

Please amend the last paragraph of page 57 through the first paragraph of page 59 as follows:

Fig. 28 shows a configuration of the composing means 4240. The composing means 4240 receives pieces of composition information 4341 and 4343, pieces of favorableness degree information 4331 and 4333, and preprocessed input images 4211, and outputs the

composite image 4250 and a depth image 4260. The pieces of favorableness degree information 4331 and 4333 are information used to show noise influence by indicating a portion subjected to little noise influence as 1 (white) and a portion subjected to large noise influence as 0 (black). Referring to Fig. 25, if it is arranged such that a noise reducing means B4350 provides larger smoothing reduction than that provided by a noise reducing means A4300, portions subjected to little noise influence, which is indicated by a value of I (white), in the favorableness degree information 4333 should be more extended than portions subjected to little noise influence, which is also indicated by a value of 1 (white), in the favorableness degree information 4331. Supposing that the pieces of composition information 4341 and 4343 have shapes as indicated in the figure, for portions in which the favorableness degree information 4331 is 1, the composition information 4341 is preferably used, while for portions in which the favorableness degree information 4331 is 0 and the favorableness degree information 4333 is 1, the composition information 4343 is preferably used. Furthermore, even though portions in which both the favorableness degree information 4331 and the favorableness degree information 4333 are 0 provide no reliable information, the favorableness degree information 4333 is arbitrarily used since either one or the other should be selected. Final composition information 4600 composed of only portions subjected to little noise influence is shown in the figure. Portions of the composite image 4250 in which the final composition information 4600 is 1 are updated with pixels of the preprocessed input images 4211, while portions of the composite image 4250 in which the final composition information 4600 is 0 are left unchanged without updating the original pixels. On the other hand, portions of the depth image 4260 in which the final composition information 4600 is 1 are updated with depth information of the preprocessed input images

4211, while portions of the depth image 4260 in which the final composition information 4600 is 0 are left unchanged without updating the original pixels of the depth image 4260. Thus, optimum composition concerning noise reduction is attained by combining portions subjected to little noise influence with their high space resolution unchanged and portions subjected to large noise influence with their space resolution decreased to reduce their noise.

Please amend the last paragraph of page 63 through the first paragraph of page 64 as follows:

Input images are preprocessed by a preprocessing means 4210, and then the noise of the input images is reduced by a noise reducing means 4300. Specific examples of the noise reducing means include a noise reduction filter and smoothing reduction. A noise amount evaluating means [4311] 4310 calculates noise amount evaluation values 4311 of noise-reduced images 4301, while a signal change amount evaluating means 4320 calculates signal change amount evaluation values 4321, which indicate in-focus degrees, from the noise-reduced images 4301. A focus determination means 4340 generates composition information 4341 using signal change amount evaluation values 4321. A composing means 5240 composes a composite image 4250 and a depth image 4260 from the composition information 4341.